The Northwestern MILLER

MILLING PRODUCTION SECTION

A Country Miller Who Enjoys Life

Burt P. Sorenson, Owner and Operator of a Business Established by His Father in 1875, Has His Own Philosophy About Milling.

By Paul L. Dittemore
Technical Editor, The Northwestern Miller

THIS is the story of a country miller and his mill. Both are remarkable exceptions from the usual mental picture. The miller is Burt P. Sorenson and his mill is a 100-sack, bob-tailed affair which squats at the south end of the principal street in Kasson, a town of about 1,350 population in southeastern Minnesota.

The ebb and flow of the economic tide in the milling industry during the past quarter of a century has not been very kind to country millers, generally speaking. In the past five years more than 400 of the small mills have gone out of business for one reason or another.

The 1942 edition of the List of Flour Mills in the U.S., published by The Northwestern Miller, contains the names of 3,001 mills. The 1952 List of Flour Mills catalogs 1,799 mills, or 1,202 fewer. It is estimated that more than 80% of the total decline in numbers of mills was accounted for by mills in the 100 sacks a day or less capacity group.

In 1949, according to the Bureau of the Census, U.S. Department of Commerce, mills of 100 sacks a day or less capacity averaged about 14% of capacity in running time, while the large mills were averaging about 87%. Translated into days a week, the small mill operated about one day a week.

Small mills, by and large, depend upon family flour sales for their living. Twenty-five years ago, approximately three fourths of all the flour produced in the U.S. was sold as family flour. Housewives did their own baking. Today the picture is just about reversed, with approximately one fourth of all flour sold reaching the ultimate consumer as flour and not as an ingredient in a finished product of commercial bakeries.

The shifting trend in buying baked goods has been the principal factor in the decline of the small mill. The miller's market for his family flour simply disappeared and the average owner of a small mill found that he finally did not have enough business to justify keeping open.

Not an "Average" Mill

But the Sorenson mill at Kasson is not an average country mill. Neither

(Continued on page 13a)

Burt P. Sorenson, son of the founder and present owner and operator of the Sorenson Milling Co., Kasson, Minn., at his desk

The buhrstone mill shown above, was originally installed in the first Sorenson mill in 1875 and has been used since that time

This picture, taken in 1905, shows the present plant of the Sorenson Milling Co., which was built in 1896

The first Sorenson mill was powered by wind and was built in 1875

Shown above is a picture of the "Rockton" mill, which was the second plant. It was built on the Zumbro River

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The Degerminated Corn Mill and Its Products

By John L. Neenan
Allis-Chalmers Mfg. Co.

THE advancement of corn milling has pretty generally paralleled the various steps followed in the development of the modern flour mill system. This has involved progressing from the rougher buhr mill grinding stages through the more refined stages of buhr mill grinding and gradually into the roller mill system, employing many reductions and separations, as we have it today.

During the development of the corn milling system, up to and including the modern straight grind roller mill system, it was found that there was a large demand for hominy grits and smaller sizes of grits. These smaller sizes could be produced on the roller mill system. However, the fat content of the larger grits remained so high that the keeping qualities of the resulting products were poor.

In the late 1880's, various types of machines were built and operated in an attempt to break the corn kernel into two or three pieces and at the same time remove the major portion of the bran and germ which contain most of the fat or oil. Some satisfactory products were produced in this manner. All of the machines, however, were of the batch type which made it necessary to load the machine with a given amount of material and hold it within the unit until the desired results were obtained, operating on much the same principle as the present day batch system barley pearler.

The first continuous degerminator was marketed about 1890. It was a long way from meeting the requirements, as the cylinder which broke the corn and removed the bran and germ was straight and had knives and studs revolving within a similarly constructed case. This arrangement made the desired clearance for adjustment rather difficult to accomplish.

A short time later, the cone-shaped revolving cylinder within a similarly shaped case was developed. Both were fitted with studs and certain perforations in the outer case. The machine could be easily adjusted by moving the rotating cone forward or backward inside the cone shaped enclosure. Further development along this line produced the standard degerminator known as the Beall, which is still in general use.

About 1900, mill designers in the U.S. started designing corn milling plants using the degerminator with suitable tempering systems, dryers, coolers, screen separators and aspirators preceding the roller mill system. This, of course, shortened the straight roller mill system which had been in general use up until this time.

The degerminating system of milling fitted in so well with the requirements of the users of milled corn products in the U.S. that most of the developments in modern corn milling have been built around the degerminating system. This is probably due to the fact that the market absorbs more hominy grits and other sizes of grits than can be sold in the form of meal or finer ground corn flour.

Corn Milling Ranks Second

The corn milling industry today, for human consumption and industrial uses, exclusive of the distillery industry and wet starch milling industry, ranks second in importance to the flour milling industry.

The total per capita consumption in accordance with the latest government statistics approximates 29.5 lb., much the greater percentage of which is ground on the degerminated corn milling system.

The steps involved processing corn in a degerminated corn milling system from grain storage to final milled products can be readily followed by referring to a flow sheet diagram (Fig. 1) of a standard corn mill with a 7,500 bu. capacity per 24 hours.

The initial operation involves proper cleaning of the corn. This, in the average corn mill, until recently has been somewhat neglected. However, the requirements of the Pure Food and Drug Act have made it necessary for the corn miller to use a number of cleaning and preparation steps to properly prepare the corn for milling purposes. In the average terminal or grain storage building this is accomplished by means of a receiving separator which removes the large foreign material from the incoming grain.

From the grain separator, the corn is passed directly into a scourer which cleans the corn by friction. The clean grain then passes to a small working bin from where it is fed by a percentage feeder to the wetting con-

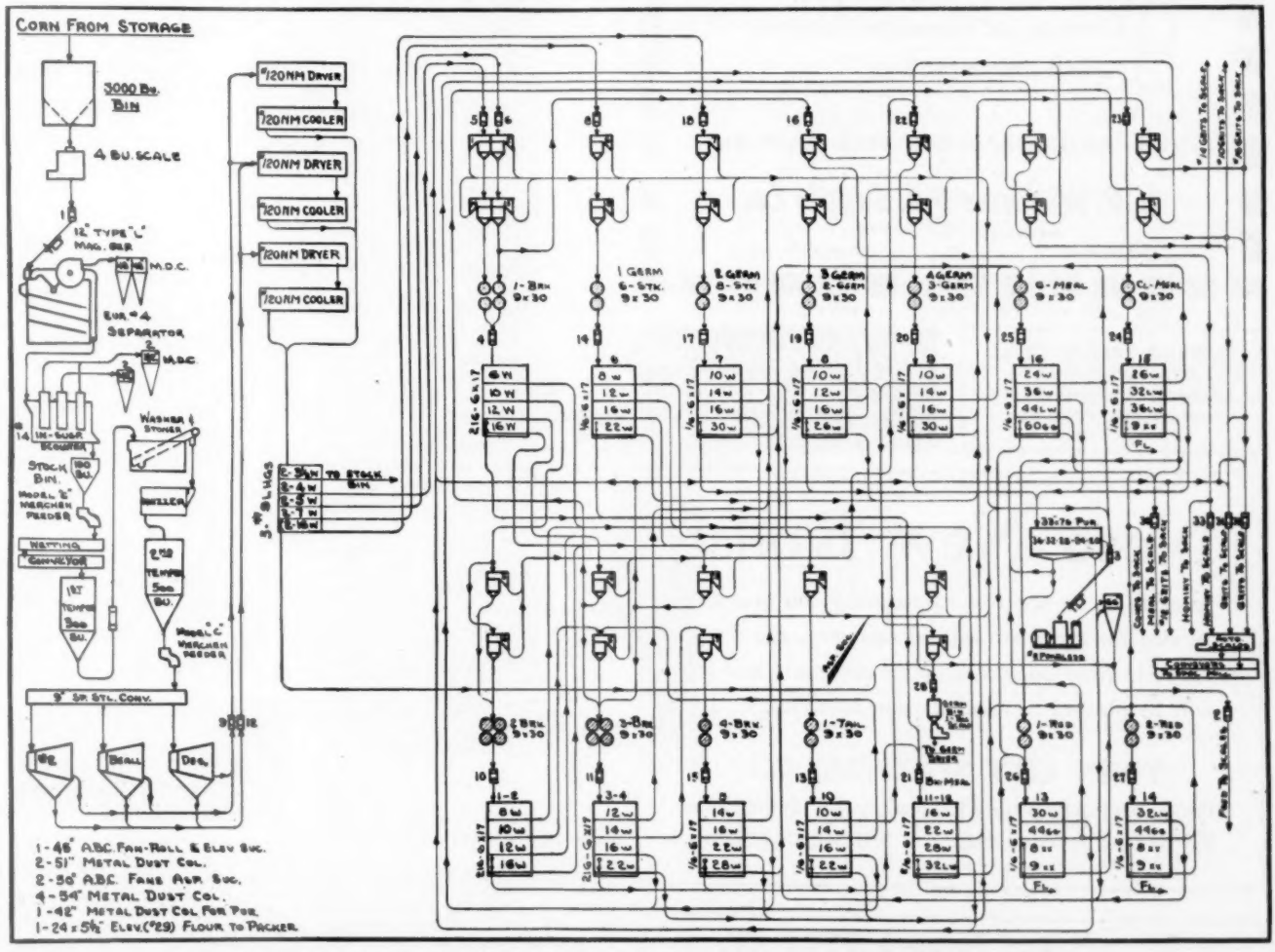

Fig. 1—Flow sheet diagram of a standard degerminated corn mill with a capacity of 7,500 bu. per 24 hours

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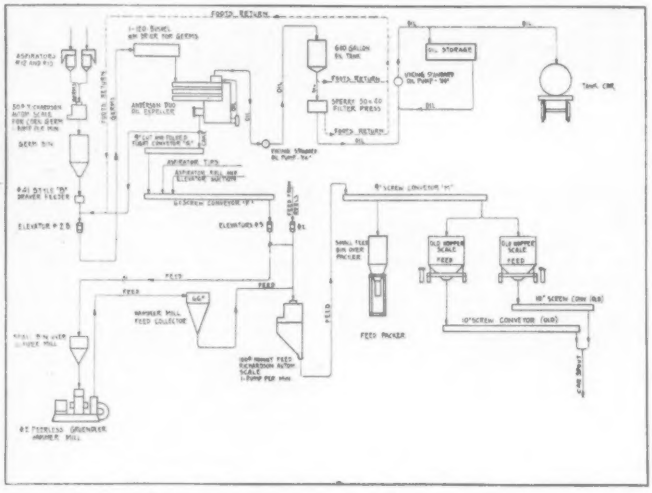

Fig. 2—Flow diagram for preparation of corn oil from the germ

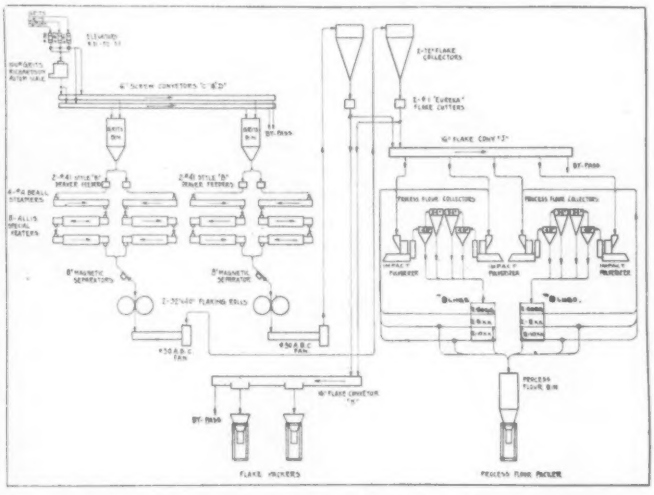

Fig. 3—Flow diagram for preparation of specialty products

veyor. Here water is added as a preliminary temper.

Until the past few years, most degerminated corn mills operated with a single tempering system. However, it has been found advantageous to use a pretemper ahead of the washer, which follows the first temper. This procedure helps soften any foreign material which may adhere to the grain before washing.

Next comes the degerminating process which roughly loosens the bran and germ from the starchy part of the corn. A degerminator consists of a slightly tapered cylinder or cone placed within a similar outside case. This machine operates in a horizontal position, the corn entering at the smaller end of the cylinder or cone and passing through to the larger end where it is discharged from the machine.

The degerminating process is followed by drying and cooling; preliminary grading, during which sifters removed the fine material produced by the degerminators, and aspiration, where the bran is separated from the starchy part of the grain by passing it through a strong current of air.

The germ varies according to the quality and variety of the corn. The locality in which the corn is grown has some bearing on the percentage of germ contained in the corn as well as the amount of oil contained in the germ. An average analysis would show approximately 6 lb. of germ in each bushel, and 25% of the weight of the germ can be recovered in oil.

To produce a food product with nutritive value, it is general practice not to remove all the germ. Only about three to four pounds is sent to the oil expeller from each bushel. A 20% oil recovery is made by the expellers or six to seven tenths of a pound of oil is obtained from each bushel of corn milled.

The greater part of the germ remaining in the corn is in the hominy feed. The germ combined with the fines produced by the degerminators, the bran removed by the aspirators, the dust from the dust collectors, and other parts of the corn bolted out during the milling process, form

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the product sold as hominy feed.

There are no definite specifications defining all the products produced by a corn mill. The term hominy or hominy grits is quite generally applied to a milled product that will pass through a 3½- or 4-mesh wire screen and remain on top of a 6-mesh wire screen.

The term coarse grits applies to a product passing a No. 10 mesh wire screen and remaining on top of a No. 12 mesh screen. Medium grits pass a No. 12 mesh wire screen and remain on top of a No. 16 mesh wire screen. Fine grits pass a No. 16 mesh wire screen and remain on top of a No. 20 mesh wire screen. The medium and fine grits combined make up the product called "brewers' grits." Extra fine grits pass a No. 20 mesh wire screen and remain on top of a No. 24 mesh wire screen.

All these are free from dust and bran and milled from the hard or flinty portions of the corn with a fat analysis of below 1% and a moisture below 14%.

Cream meal may be bolted through a No. 24 mesh wire and dusted over a No. 8XX silk for one locality, while another community may desire a much finer product, often equal to a No. 40 mesh screen.

Cones are a finer grade of meal, granular in texture and free from dust or flour. This product is sifted through wire or silk screens varying from 40- to 52-mesh per linear inch.

As the gradual reduction system of milling is used in producing the finer grades of meal and grits, many separate grinding and bolting operations are used. This system necessitates bolting or screening of stock between each grinding step. Gyratory sifters are used for making the various separations and additional aspiration is required between each sifting and grinding step.

Many degerminated corn mills of smaller capacity operate without reclaiming the oil. By so doing they are losing a substantial revenue. Any efficiently operated corn mill will produce upwards of six tenths of a pound of oil per bushel ground.

Since practically all the oil in corn is in the germ, the germ as separated from the corn during the milling process is collected and stored in a working bin. From this bin, the germ is dried to approximately 3% moisture content ahead of the oil expeller or continuous screw press which removes the oil from the germ leaving the germ meal which has about a 5% oil content. The steps involved in this process can be followed in Fig. 2.

In the average corn mill, about 3 or 4 lb. of germ per bushel of corn is sent to the oil recovery system, and the germ cake is generally ground with the balance of the hominy feed. However, at times the larger mills keep the germ meal separate as an additional revenue can sometimes be obtained from the sale of this high protein product. The oil from the expeller is pumped to a settling tank and thence to a filter press for further clarification. This crude oil must be refined for production of edible oils. The bulk of corn oil produced on a degerminated system of this type is absorbed by manufacturers of edible oils and cooking fats.

Where millers operate a specialty plant in connection with their standard corn mill operation, the raw material can consist of standard hominy, No. 6, No. 8 or smaller grits, and in an emergency or to balance the sales on various products, a limited amount of corn meal fed with the grits.

The major equipment used in such an operation consists of steamers and heaters, 32x40-inch flaking mills, impact pulverizers, "Low-Head" gyratory sifters, suction systems for handling flakes and packers for flour and flakes.

Products produced in these specialty plants are brewers' flakes, foundry flour or core binder, butchers' process flour, cold water paste, and bakers' dusting flour. The manner in which they are produced can be followed in Fig. 3, which shows the grits being drawn from the working bins through two batteries of Beall steamers and jacketed heaters for each flaking unit. From the heaters, the semi-processed grits drop over a magnetic separator directly into the flaking mill.

The flaked material leaves the roll of the mill in sheet form, is picked up by a suction system which draws it through the fan where it is broken into pieces not over one inch in size and blown to a specially constructed dust collector. The collector delivers the flakes through a flake cutter for a further reduction in size to the brewers' flakes packer.

When processed flours are the desired products, the flakes are passed from the cutter by means of a distributing conveyor to the pulverizers, which are impact machines. The material is held within the grinders until approximately fine enough for finished products. These machines are fitted with air separators which control the mash size of the ground material fairly well. The "Low-Head" gyratory sifters give more accurate control of the screen mesh size. The oversize material separated by the air separators and sifters is returned to the pulverizers with the incoming feed.

All these special products have certain absorption and specific gravity requirements which are dependent entirely on the industry for which they are used and somewhat further

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on the requirements of the customer.

The products manufactured on the specialty unit generally have a larger margin of profit than standard corn mill products sold in the form of meal, grits and flour and are an invaluable supplement to standard milling operations.

There are many special screen sized products produced in both standard corn mill and specialty operations and in addition, products in the specialty line to which supplements or preservatives are added to meet the trade requirements and broaden the market for the mill products.

Milling's Golden Era

Bolting Machines—Reels and Sieves

By W. D. Gray

FOR some time after rolls were introduced the practice was to scalp the stock from the break rolls on hexagon reels, usually made shorter than the regular reel, running from 6 to 12 feet long. But as there is no better surface for scouring than a wire cloth, it was soon discovered that these hexagon reels, no matter how short, scoured the stock too much, and made too much break flour, often making more flour in the reels and conveyors than on the rolls. This, of course, led to efforts to get up a scalper that would overcome the difficulty. The scalpers devised were mostly of the sieve type, some of them simply running the stock over a stationary sieve, sometimes dropping from one sieve to another. These sieves were usually straight and set at an angle, so that the stock would travel on them; a so-called improvement was made by curving the sieve. Usually, an extra sieve was used to scalp off the coarse middlings to go to the purifier.

For a time these machines seemed to answer the purpose, especially in the hard wheat district and where they had plenty of attention. The trouble with them was that you could not depend on them as the cloth would fill up and had to be brushed by hand. As the main object sought for was less scouring, I doubt if this was much of an improvement, as stock running rapidly over an inclined sieve covered with wire is still quite a scourer. An improvement was made by making all the sieves to vibrate, and adding traveling brushes under them. The sieve motion was not reciprocating, like our purifiers, but a fast vibration caused by cams and springs.

There were several styles of scalpers made. Every manufacturer varied his design, and usually had a patent on it. Some of these machines did excellent work, and a few of them are still in use, but as a general thing they have found their proper place in the bone-yard. One of the reasons, I think, for their being abandoned was the high speed vibration, and the many pieces and parts necessary in order to have traveling brushes under each sieve. Their liability to let the stock pass over them without being scalped made them trappy and hard to look after, so that in mills where they did not receive the best attention they were soon thrown out. This cut represents the best of its type. See Fig. 1.

In the meantime, having tried several kinds of sieve scalpers without thinking them any improvement of a permanent nature, I busied myself in another direction by producing

EDITOR'S NOTE: The accompanying article is the 15th in a series being published under the heading "The Golden Era of Milling." This and preceding articles were first published in The Northwestern Miller more than 50 years ago and deal with developments during the period from 1875 through 1900.

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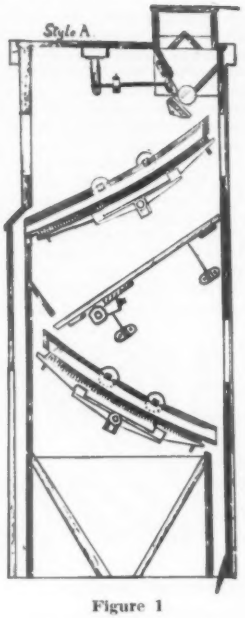

Figure 1

what was known as the Gray double scalper. See Fig. 2.

This machine had to scalp the break, a perforated sheet steel jacket for the inside cylinder. Inside of the cylinder were carriers to distribute the stock, the broken wheat passing

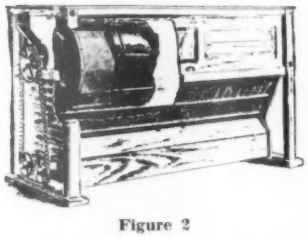

Figure 2

over the tail to the next break. What passed through this inner cylinder dropped upon a sheet iron cylinder made conical, the largest end being at the head of the reel. This cone carried all the stock back to head of reel. The conical cylinder was surrounded by a cloth cylinder covered with silk, with carriers fastened to the cone to distribute and spread the stock; so that all the stock that passed through the inner scalping reel was carried back to the head and caused to pass over the outer reel clothed with silk.

The intention was to take all the flour and fine middlings through the head end, and the coarse middlings over the tail, and the next grade of middlings through the silk at tail of reel, these two grades of middlings going direct to purifiers, and the fine middlings and flour to other reels to be separated, the reel revolving all together on one shaft.

The theory of this reel is good; the inner reel being smooth sheet steel, we got rid of the scouring action of the wire cloth. The conical cylinder between the scalper and the outside cylinder carried back the flour and middlings to the head of the silk on a smooth surface, avoiding any pulverizing or scouring action as would be the case with conveyors, and thereby sending two grades of middlings direct to purifier without passing through conveyors.

While this machine has many good points, and a great many of them were put into use, it may be said to be practically out of existence. The drawbacks to it were that it was more complicated than the ordinary reel, and there was a tendency on some stocks and in some sections of the country for the inner cylinder to fill up. When from that, or any other cause, it became necessary to get into it, it took a good deal of work and time; besides, it was an expensive machine.

Practically the same results could be obtained by using my inner scalper as a separate reel; and, placing it on top of a flour dresser, do the scalping with the upper and the grading with the lower reel. It was more

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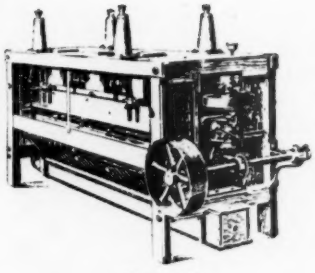

Figure 3

accessible, did not cost any more, and was less liable to get out of order. This practice I have followed in a great many of the best and largest mills in this country, and many good millers are still using them. They have this, at least, in their favor—as little scouring as it is possible to do in a reel scalper, large capacity, small liability to get out of order, and slow rotary motion. An oiler can look after them.

But, having had a taste of sieve machines, which had shown some good points and many bad ones, it was not supposed for a moment that they were to be dropped. There were flat sieves tried with reciprocating motions and with cam motions; but they lived on for a day and were gone. Then there were several scalpers introduced with flat sieves with a gyrating motion. Now there was nothing new in this machine, as some of the manufacturers would have us believe, for it had been used in other trades, but it seemed to do better for scalping than any other sieve scalper that had been tried up to this time. See Fig. 3.

This machine was built 6 to 8 feet in length, with a cloth about 30 inches

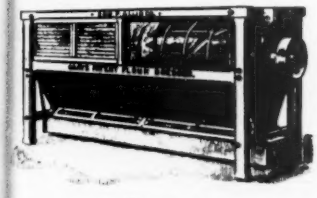

Figure 4

wide. The sieve is hung on four hangers perfectly level, and if the machine is used for a single break it is fed along the entire length of the sieve, the stock traveling only 30 inches across the sieve, and the tailings discharging at the opposite side. So it will be seen that the sieve being plain, and the travel only 30 inches there can be very little scouring action.

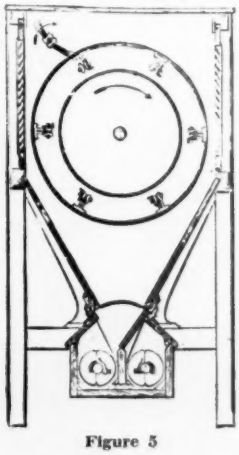

Figure 5

If the machine is simply for a scalper it has only a single sieve. If it be desirable to grade off one or two grades of middlings, then there is a sieve covered with silk below this one. Under this sieve and running lengthwise there is a shaft that drives a little upright at either end, with a crank that gives the sieve the gyrating motion.

If the grading sieve is used, then there is a right and left hand thread cut on this shaft to drive a brush to clean the silk; this brush is adjustable and independent of the shaft. If the machine is used only for a scalper, and has a single sieve only, there is no brush and the shaft is plain, as the action of the stock on the sieve keeps the wire cloth clean.

This machine requires but little power, has large capacity, is inexpensive and not likely to get out of order, can be divided into three, four or five sieves for as many different breaks as desired, or used as one break in large mills. It makes an excellent scalper and grader to the extent of one or two grades of middlings; but if we try to go further with it, it becomes complicated.

It might also be considered the connecting link between the old sieve scalpers already described, and the new type of sieve bolters which I will describe further on. It is the connecting link because it existed here before them, and still exists. Time alone can tell, but I am inclined to think that it may continue to do the simple scalping for the breaks, while the bolting may be done by some of the many sieve bolters now on the market, and being urged as the perfection of bolting machinery.

But as the search to get a perfect flour dresser or round reel was still going on, I made practical tests and

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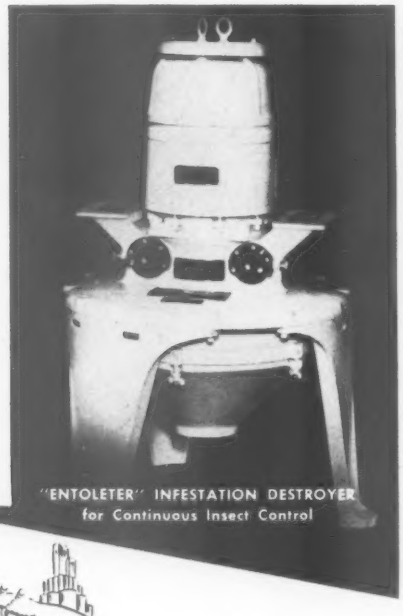

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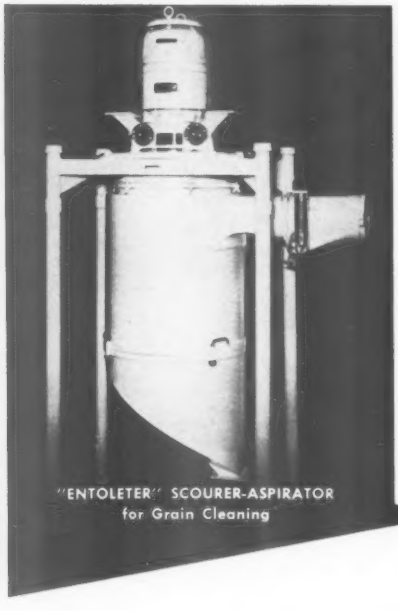

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experiments for many months, at great expense. Having a mill close to the shop at my disposal, I could put these machines to the only tests that have any value; that is, giving them the work to do that they are intended to do, and run them night and day. This I did, making many different forms of machines, and many changes, until I got the reel, as shown in the illustration, of a Gray flour dresser. A brief description of which follows. See Figs. 4 and 5.

This machine has a round, solid, smooth cylinder, preferably of sheet steel, eight to ten inches smaller in diameter than the outside diameter of the reel, and keyed to the reel shaft so that it revolves with the reel.

This leaves a space of four to five inches between the inside drum and the silk. In this space there is a series of buckets or carriers so shaped that they spread the stock over the silk on the up-going side, and if the reel becomes overloaded, the buckets will carry the surplus stock over the top of the drum and it will come in contact with the silk on the down-going side, thereby largely increasing its capacity. The buckets or carriers are placed so that they come within an inch or 1½ inches of the silk, according to the kind and amount of work they are intended to do.

There is also a space left between the inner edge of the bucket and the drum, so that if the machine gets more of a load than is intended, it cannot be choked. Neither can the buckets and cylinder combined act as an elevator bucket to keep the stock off the silk, and thereby prevent the process of bolting; but the stock will drop upon the smooth drum and slide off to either side and upon the silk, and the process of bolting be continued.

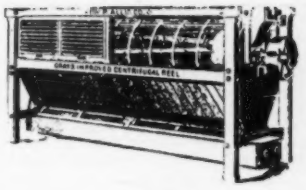

Figure 6

The main object of this drum is to prevent the stock from dropping across the full diameter of the reel and cause a forced bolting, and consequently specky flour. Instead, any stock striking the drum will slide gently upon the silk. These reels are built with very little pitch, and in order to carry the stock through the reel there is a series of iron spiral flights fastened to the drum so that with the reel running in the right direction, the spiral acts as a conveyor.

For example, the reels that I described in the beginning of this article always carried a heavy load and would keep tailing over for a long time after their feed had been cut off. Almost as soon as the feed was cut off the reel stopped tailing over; showing that while it had a very large capacity it did not carry a large load.

I consider this reel a great improvement on any that had gone before and almost as perfect a reel as can be made; for it has large capacity, requires little power, is so constructed that it bolts as clean and gentle as is possible, and is simple and not liable to get out of order. There are thousands of them in use in the largest as well as in the small mills of this country, and they are still being put in.

A brief outline of the present bolting apparatus of American milling would be: For scalping, the round scalper with sheet steel, instead of wire cloth; or, the plain flat sieve with the gyratory motion with or without a grading sieve, that for the scalping of the breaks; for the bolting of all patent and all stocks that are sharp or free, the flour dresser, such as I have just described, no forced bolting being used; for soft or flattened stock at tail end of mill, or in some cases for dusting very fine middlings, use centrifugals. The above description of bolting is intended to describe the best method before the advent of the sieve bolter.

The cuts of the Gray reel (see Figs. 6 and 7), show a fair sample of American centrifugals. I do not believe it good practice to use anything in the nature of a centrifugal or differential reel for any stock that is free enough to be bolted on a flour dresser; and

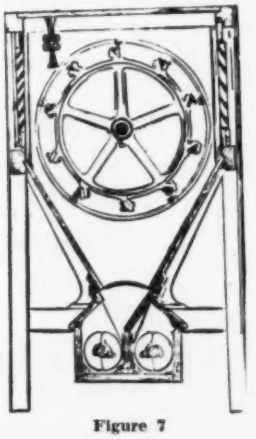

Figure 7

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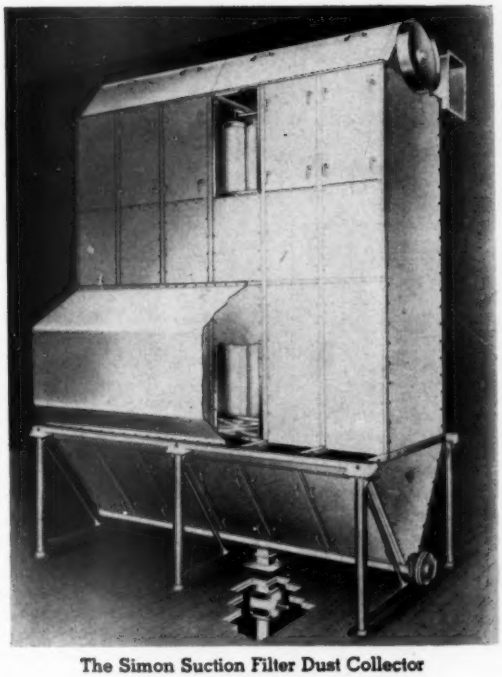

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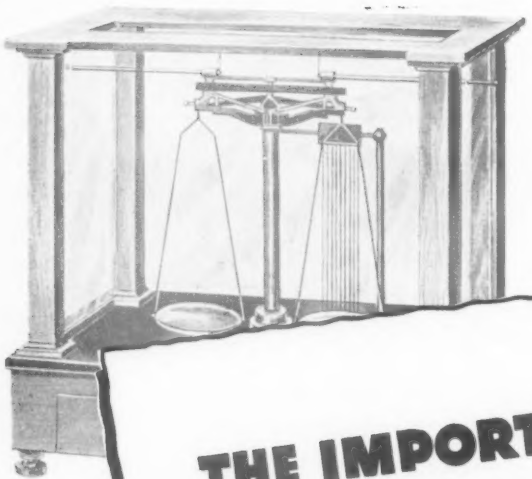

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there are comparatively few places where it cannot be used. Of course, in very warm or damp climates, where the mill is on the short system, there would be a greater excuse for using more centrifugals. A centrifugal is a good thing to use when you can find nothing else that will answer the purpose, but it is well to use as few as possible. They are hard on silk and take too much oil and power. I write thus plainly about the centrifugal, although knowing well that it is opposite to the English practice. As a general thing English flour is all made on centrifugals and the stock scalped before going to it on a reel scalper.

It has been no easy matter for millers and milling engineers after having come through the great change of purifiers, and the still greater change of rolls, to bring the bolting system to its present state of perfection. All the machines were now so compact and well constructed that it was a real pleasure for a milling engineer to get a chance to build a large new mill with them. It was not only easy to build a mill that would do good work, but the mill would also be a thing of beauty, something that a man who took an interest in his business would be proud of. This was my own experience, and I suppose it was the same with others. We naturally felt as though we had reached a camping place, and could have the rest we were justly entitled to.

But our rest was of short duration; unrest was in the atmosphere. We had spent a lifetime in changing, but we must continue. I have explained what we had done with the flat gyratory sieve, to the extent of scalping and grading; but during this time Carl Haggenmacher of Budapest was working on the flat sieve for the purpose of doing all the work of bolting and scalping, using the gyratory motion. The Haggenmacher plansifter will be described in the next article.

——BREAD IS THE STAFF OF LIFE——

Rapid Test Measures Viability of Corn for Industrial Use

A RAPID test for the viability of corn for industrial use is described in a recent issue of Cereal Chemistry, official journal of the American Association of Cereal Chemists.

The test was devised by Peggy D. Baird, M. M. MacMasters and C. E. Rist of the Northern Regional Research Laboratory, Peoria, Ill., one of the laboratories of the Bureau of Agricultural and Industrial Chemistry, U.S. Department of Agriculture. It depends upon a chemical reagent, 2,3,5-triphenyltetrazolium chloride, imparting an easily discerned carmine red color to living portions of the germ.

In prefacing the details of the test, the authors state that corn processors have long needed a rapid test to determine, before purchase, the suitability of grain for their use.

"In the past few years this need has grown as the result of the increasingly prevalent practice of drying corn artificially," the authors state. "Several factors have contributed to make artificial drying a more common practice, chief of which is the present widespread use of mechanical corn pickers."

It was stated that some corn wet millers have been loathe to purchase corn from a county in which a commercial drier was known to be operating because over-heating during drying damages corn for starch production. Processors have stated that dead corn is undesirable for the production of starch. These facts, together with the experience of seed corn producers that over-heating destroys viability led to the investigation of a test for viability of corn which might serve to indicate the value of the corn for industrial processing.

The test is described by the authors as follows:

"One hundred kernels of the corn to be tested were soaked for from 1 to 2 hours in distilled water. The shorter period was used when soft corn was tested, the longer when naturally or artificially dried corn was being examined. After soaking, each kernel was bisected longitudinally perpendicular to the broad face. The cut was made with a sharp razor blade while the kernel was held under distilled water. Bisecting under distilled water tended to prevent the

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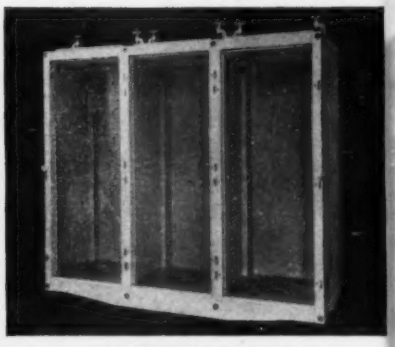

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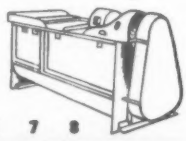

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formation of a deposit over the cut surface.

"One half of each kernel was laid, cut side down, in a petri dish containing sufficient 1% aqueous triphenyltetrazolium chloride solution to cover the kernel pieces. The dish was then placed in a dark cabinet at room temperature for from 1 to 1½ hours. The kernel pieces were then examined to determine viability. The variation between duplicate samples was within the range, 0-5%.

"The viable parts are colored carmine red by this procedure. In strongly viable corn (i.e., kernels which will give vigorous seedlings), the entire germ, composed of the embryonic plant and the scutellum, is colored. There are certain instances, however, when only portions of the germ are colored yet the seed is still viable.

"If only strongly viable corn is considered to be suitable for use, the period of contact of the kernel pieces with the reagent can be limited to 30 minutes. In this case only those pieces which show a pink color over the entire cut surface of the germ would be counted as viable.

"In cases of urgency at least a close estimate of the viability of corn can be made with triphenyltetrazolium chloride in only one hour. The corn is bisected without preliminary soaking, and the viability is determined after a one-hour staining period. There is some mechanical difficulty in bisecting the hard kernel. The resulting damage to the cells sometimes causes formation of a heavy scum which must be removed before the viability of the kernel is determined."

The authors caution that the reagent solution is sensitive to light but it can be kept for several months in a dark bottle stored in a refrigerator. It is colorless when prepared and appearance of a dark amber color indicates that it is no longer useful.

They conclude that, on the basis of the knowledge at hand, the test for viability with the reagent appears to offer promise for the determination of the industrial suitability of corn as offered for sale. This test requires no complicated equipment, relatively little time, and a minimum of technical knowledge on the part of the operator.

——BREAD IS THE STAFF OF LIFE——

$1 500,000 ELEVATOR

KENNEWICK, WASH.—Construction of a $1,500,000 grain elevator here, now under way for the North Pacific Grain Growers Assn., is scheduled for completion in September. The elevator is being erected by George & Sons, Spokane, on land purchased from the port district.

Country Miller

(Continued from page 1a)

is Mr. Sorenson an average country miller.

The mill itself is not much to look at. It is small, and is housed in a frame building sheathed with corrugated iron, containing a collection of old machinery which probably would cause a miller who is accustomed to "modern" machines to throw up his hands in dismay.

The first piece of equipment the modern miller would notice, and show curiosity about, is a 48-in. buhrstone mill that has been making flour since 1877, according to Mr. Sorenson.

Other items of almost equally ancient vintage include six stands of rolls which Mr. Sorenson said were "new in 1894." They are 7-in. by 18-in. Nordyke & Marmon stands, three of them on the break system and three on the reduction system, which is just about as short as milling systems go.

The only new or modern piece of equipment in the plant is a 4-section sifter. The purifiers probably would be classed as ancient and the same holds true for the grain-cleaning machinery, the air system and the packers. But the remarkable feature about the mill and its miller-owner is that both continue to chug away, making one grade of flour—a high patent family flour—and three specialty products: Self-rising buckwheat flour pancake mix, self-rising wheatcake mix, and a whole wheat flour. The buckwheat and whole wheat flours are ground on the old French buhrstone mill. The wheat flour is produced on the roller mills.

Mr. Sorenson's flours have been sold under the same brand name, and in the same type of package, for more than 60 years, and the granddaughters of the original housewife purchasers of Sorenson's "Gold Lace" flour continue to come back for more. The same is true of the mill's "Rockton" self-rising buckwheat pancake mix and the whole wheat flour. Mr. Sorenson said that nothing has been

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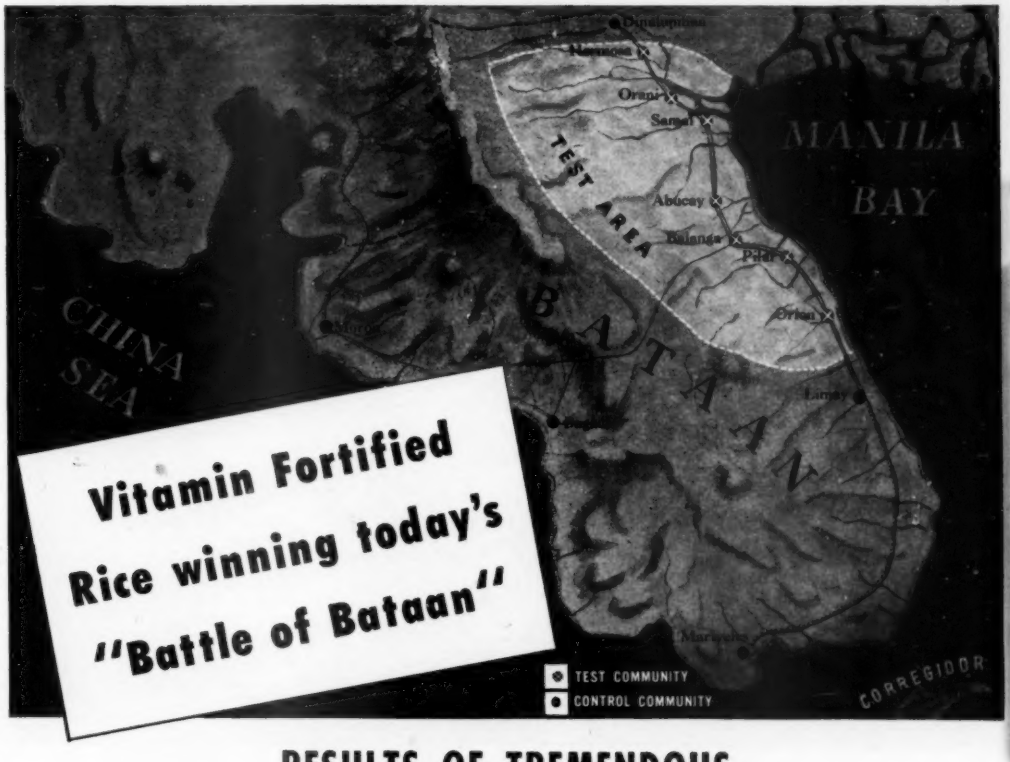

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★ Symptoms of 2nd most fatal disease reduced 70%

★ Beriberi deaths steadily falling

In an experiment in the Philippines now involving over 90,000 persons, conducted with the approval of the Philippine government and medical associations, and in which Hoffmann-La Roche is proudly cooperating, remarkable health benefits from rice enrichment have been demonstrated. This is reported by Juan Salcedo, Jr., M.D., M.A., Director of Nutrition, Institute of Nutrition, Manila, P.I.

With rice the principal food, and beriberi the No. 2 cause of death, this new "Battle of Bataan" was planned and waged to determine whether enrichment of rice would reduce the incidence of beriberi. Bataan Province was selected because of its high beriberi mortality and because rice traffic could be readily controlled there. (Early investigation showed enriched rice completely satisfactory in taste, color, odor, palatability and digestibility.)

*"There are indications from raw data available from the present clinical beriberi resurvey that the beriberi incidence has been reduced by 70%."**

Beriberi mortality rates have also steadily dropped in the "enriched rice" area without significant change in the control area.

★ Infantile beriberi virtually eliminated

This dramatic and specific evidence of the benefits of vitamin enrichment should have a vital effect in improving the health of peoples all over the world.

WHAT THIS MEANS TO YOU

While this experiment concerned white rice, it proves the benefits to public health through enriching white bread and rolls, family white flour, and other processed cereals. Any miller of wheat, rice, or corn—any baker—any macaroni and noodle manufacturer, who is not now regularly enriching his products may well ask himself if he can any longer afford to withhold such extensive health benefits from his share of the consuming markets.

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changed in the method of manufacturing or marketing the flour for the past 50 years. He should know. He grew up in the mill and took it over in 1920 upon the retirement of his father, O. C. F. Sorenson, who established the business in 1875.

Products Lack Promotion

Sorenson's "Gold Lace" family flour and the "Rockton" buckwheat flour probably are nonentities as flour brands go. He has no advertisements in magazines or newspapers or no other promotional literature to make the names known to flour buyers and housewives. He said that perhaps he could sell more flour if he advertised, but he added that he thinks he is selling enough.

Neither does he have a salesman to call on flour jobbers or grocery wholesalers to spread the brand name and its fame abroad in the land. He just sits and waits for the orders, which, he says, will come in. "They've been coming in that way all the time there has been a Sorenson Milling Co.," he asserts confidently.

"Here's what I mean," he said, handing this writer a collection of letters and postal cards. One was from a wholesale grocery in North Dakota, another from a retail grocer in Minnesota; another a postal card from a housewife in Newton Center, Mass., and still another postal card order from Los Angeles, Cal.

True to the tradition of a country mill, much of the business is accounted for by grist milling for the farmers in the Kasson community. Mr. Sorenson said that he had "quite a number of farmers who regularly hauled their wheat to the mill and had it ground into flour. The millfeed is retained. "I've got a good demand for my millfeed," he said, "and I get a good price." Probably that short three-break system has something to do with the quality of the mill's by-product feeds.

Mr. Sorenson is a miller who takes considerable pride in the quality of his product and admits that he gets a lot of personal satisfaction from his work. He said that milling good flour perhaps could be classed as much a hobby with him as it is a vocation.

Likes Old Buhrstone Mill

He has an affection for the old buhrstone mill bought by his father more than 75 years ago. He confessed that "there's something pleasant about the song of that old mill when it is running that is music to my ears."

"You probably never have seen a buhrstone mill in operation," he continued. "When it gets warmed up and is grinding away, there is a certain musical note in the sound of its grinding. After a while, you can just tell by the way it sings whether it is grinding the way you want it to grind."

The Sorenson Milling Co. had its beginning in 1875 when the elder Mr. Sorenson, an immigrant from Sjaelland, one of the islands in the Baltic Sea which makes up Denmark, built a wind-powered mill at Claremont, Minn., approximately 15 miles from Kasson.

Two years later, because his business had increased and because the wind was not a very dependable source of power, Mr. Sorenson built a water-powered mill on the Zumbro River about two miles distant from the site of the windmill. The river mill site was given the name of Rockton. The water-powered mill continued to grind until 1894, when it was again necessary to build a larger mill. This time the elder Mr. Sorenson chose Kasson, which by that time was a thriving village located on the railroad.

The French buhrstone was moved from mill to mill, along with other equipment, but the Kasson mill's capacity was increased by the addition of the Nordyke & Marmon roller mills.

The mill at Kasson was equipped with a steam engine to drive it. The old engine, after many years of service, finally wore out and an electric motor was installed in its place.

Local Farmers Grow Buckwheat

The mill has a storage capacity of approximately 2,000 bu. wheat and buckwheat which Mr. Sorenson buys from the farmers in the Kasson community. He said that he is a "choosy" wheat buyer and is grateful for the loyalty of his farmer wheat and buckwheat growers. There is no written contract between Mr. Sorenson and the farmers who grow buckwheat for him. The crop is not a very common crop in Minnesota but Mr. Sorenson's farmer friends around Kasson grow buckwheat year after year more from a sense of loyalty to the Sorenson mill than from habit or because it is a good cash crop.

In milling the buckwheat, Mr. Sorenson uses the first break roll of his mill as a huller, lifting the hulls off by screening and conveying the hulls to the boiler room for burning. After the buckwheat has been hulled on the roller mill, it is up to the old buhrstone mill to grind it to flour. The buckwheat flour is used in making the "Rockton" self-rising buckwheat pancake mix, and is also packaged as a straight buckwheat flour.

Pancake Mix Formula Unchanged

The Rockton buckwheat pancake mix formula, Mr. Sorenson said, is a closely guarded secret. It has been packed for retail sale in 2½-lb. coat-

Not which one ... ALL contain V-90*!

Of course, they all contain S-L-O-W acting V-90 phosphate because there is no substitute for customer satisfaction . . . no substitute for the outstanding baking performance assured only by V-90! The unique leavening action of V-90 helps you give your customers what they want . . . helps you build repeat sales!

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STIMULATES SALES . . . STIMULATES SALES . . . STIMULATES SALES . . .

Shown in the picture above are three roll stands, 7 in. by 18 in. Nordyke & Marmon, in the break system of the Sorenson mill. The stands were installed in the mill when it was built in 1896.

ed paper bags for more years than Mr. Sorenson can recall. The design of the printed material on the bag has never been changed and the type face used in the printing is one that old catalogs in print shops indicate was in vogue in the 1890s. The printing is in a brilliant fire-engine red. The only printing on the back of the package is the Sorenson slogan, "There's Nothing Like It." The sacks are hand-tied. The paper bags for packing the pancake mixes have been supplied "for a long, long time" by the Minneapolis plant of Bemis Bro. Bag Co. The original printing was done from wood block engravings and that design has been continued.

The Sorenson line of flours also includes a self-rising wheatcake flour. The self-rising flours are blended in a small batch mixer which has a capacity of about 400 lb. The mix is packed off in a small hand-packer.

Mr. Sorenson readily admits to being 74 years of age. His father lived until he was almost 93, spending the last 20 years of his life in California after turning the mill over to his son in 1930.

As one talks to Mr. Sorenson and listens to his simple recitation of his philosophy, it is difficult to disassociate the miller of Kasson with Dad Fetchit, the fictional owner and operator of the equally fictional Fish River Roller Mill. The pungent bits of philosophy expressed by Dad Fetchit in The Northwestern Miller and the observations on life, one's work, one's way of living as expressed by Mr. Sorenson are remarkably similar.

Philosophy of Thoreau

Mr. Sorenson's philosophy may have been acquired from his early reading of the works of Henry David Thoreau, author of the classic "Walden; or Life in the Woods," a narration of his two years of living in a hut of his own construction near Walden Pond in Massachusetts.

Mr. Thoreau believed that the less work one did, over and above the positive demands of necessity, the better for him and the community at large. He would have had the order of the week reversed—six days of rest and one of work. Mr. Thoreau, according to his biographers, was not a lazy, shiftless man. He was quite industrious and, while his profession was that of a surveyor, he was a naturalist at heart.

Neither is Mr. Sorenson lazy. He, too, is quite industrious. He believes in living his life to its fullest. "I simply cannot see any point in working hard, week in and week out, year after year in order to amass a sufficient amount of money to enable one to retire," he argues. "In nine cases out of ten, I have observed that the man who does that doesn't know what to do with his leisure time after he retires and he is worse off than before. He's lost and he's unhappy."

To illustrate: Mr. Sorenson's avocational interests center largely in out-of-doors activities. He has an old model automobile which is kept in good repair. He has three purebred

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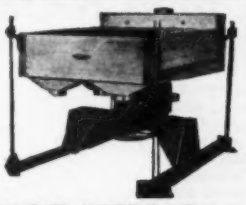

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Beagle hounds, a canoe, a tent, plus camping and fishing equipment.

"When I feel the urge to take a vacation in the summertime, I lock up, load my camping equipment and canoe and one of the dogs in the car and take off for a lake," he said. He added that he usually spends a couple of weeks on an expedition of this type, fishing, swimming and lying in the sun "until I get as brown as an Indian."

About 20 years ago Mr. Sorenson decided that a trip around the world would be interesting. So he and Mrs. Sorenson, in company with a Minneapolis couple, took a long, leisurely trip that took them to England, France, Italy, Spain, Portugal, North Africa and other countries in the Mediterranean area.

They have spent some time in California during the past nine winters, and in January he confessed to a hankering for taking off on a trip again. "We'll probably go down to Savannah, Ga., and visit our son," he said.

The miller of Kasson is a highly respected individual in his community. He has served on the village school board for a number of terms, and while his two sons were 'teenagers, he organized and was the leader of a Boy Scout troop for six years.

Naturally, the Boy Scout troop under Mr. Sorenson concentrated its activities on out-of-doors projects. The troop built a camp on the site of the old Rockton mill on the Zumbro River a few miles from Kasson. While the mill was moved from the location in 1894, the site on which it stood and a 30-acre piece of land bordering the river, has remained the property of the Sorenson family.

Neither of the two Sorenson sons are millers. Both are graduates of the University of Minnesota. One majored in electrical engineering and is employed by the Union Bag & Paper Corp., and the other majored in music and lives in Kasson where he teaches music.

Mrs. Sorenson is the company's director of products control in fact if not in name. Mr. Sorenson said that she bakes every day, adding that "there is no surer test of your products than to try them out in your own kitchen."

By the usually accepted standard of measure, Mr. Sorenson probably would not be catalogued as a successful man. He does not have a bank full of money. But if the attainment of a goal or the fulfillment of a desire is a measure of success, he is a successful man. He has found joy in his work and in living, and, according to Mr. Thoreau's logic, Mr. Sorenson's way of life has been better for him and for his community.

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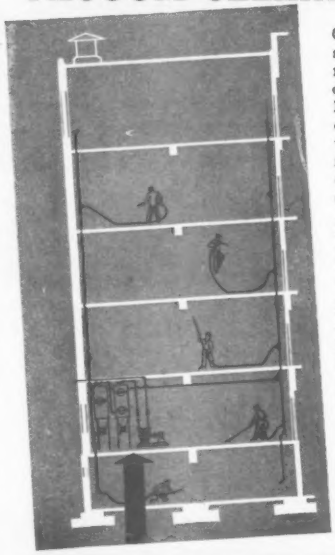

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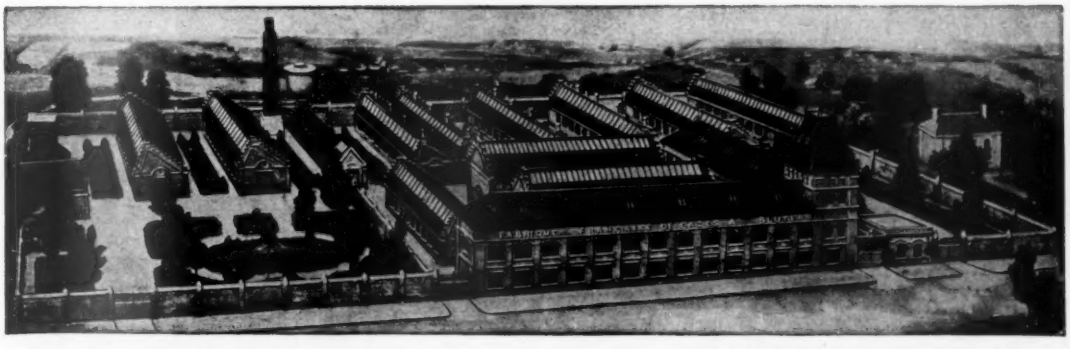

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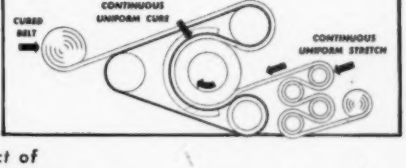

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